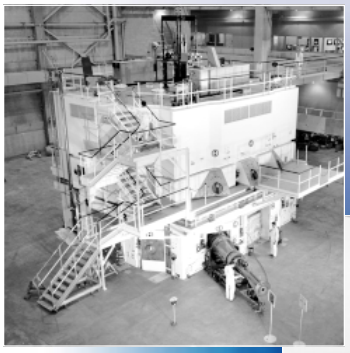

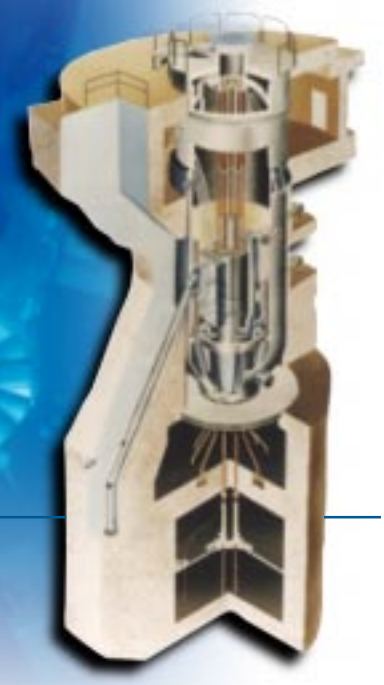

Unique facilities and innovative scientists and engineers have long kept Idaho at the forefront of nuclear energy research, development and demonstration.

Nuclear Programs

Nuclear Power Pioneers

In 1949, the U.S. Atomic Energy Commission established the National Reactor Testing Station – now known as Idaho National Laboratory (INL) – to take on the top-priority mission of harnessing the power of the atom for peaceful applications.

In the years that followed, thousands of world-class scientists and engineers made Idaho their home, and devoted their careers to advancing the state of the art in nuclear research and development. The results of their labors are legendary.

- In 1951, Experimental Breeder Reactor I produced the first usable amounts of electricity from nuclear power.
- In 1955, the Borax-III reactor provided electricity to Arco, Idaho – the first time a nuclear reactor powered an entire U.S. community.
- The Advanced Test Reactor, one of the world's most consistently updated and capable materials test reactors, became one of the two primary reactors in the

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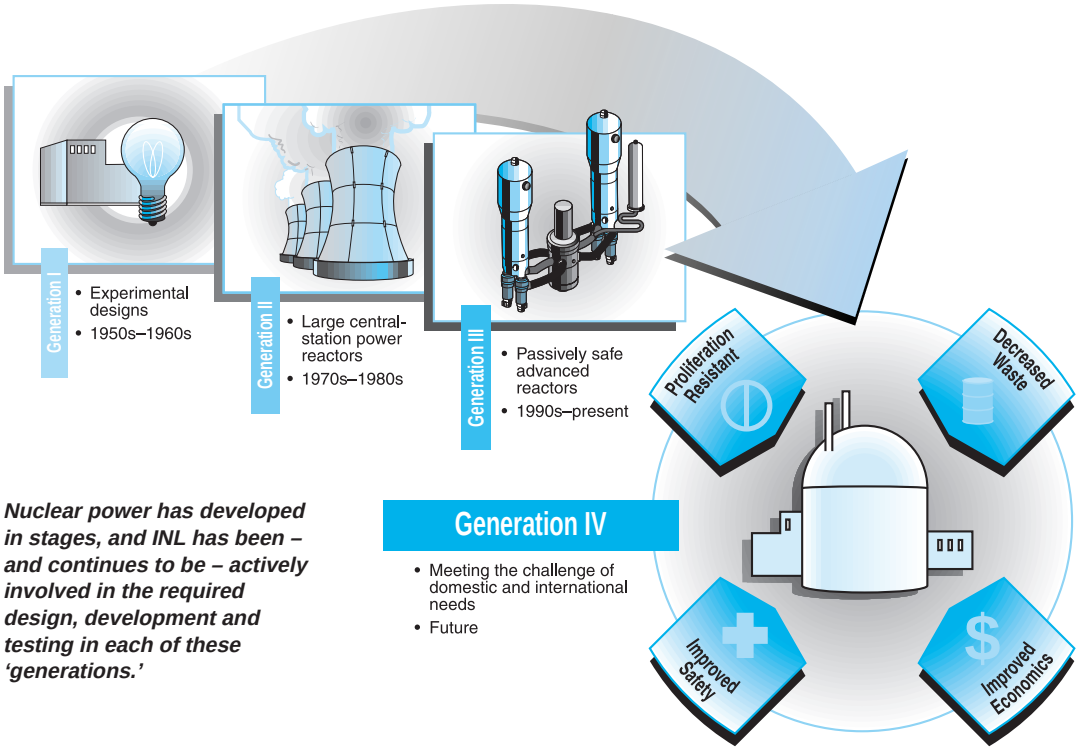
Nuclear Programs

Idaho National Laboratory



Nuclear power has developed in stages, and INL has been – and continues to be – actively involved in the required design, development and testing in each of these 'generations.'

that provides one-fifth of our electricity without generating greenhouse gases. INL's activities include:

Nuclear design and engineering

- Researching and developing Generation IV nuclear technology, which has the potential to generate reliable base-load electricity when the sun's not shining and the wind's not blowing, as well as hydrogen for fuel-cell automobiles
- Advancing analyses to improve nuclear plant operations and safety as well as licensing and regulatory processes
- Working on technologies to reduce the quantity and hazard of used nuclear fuel and high-level waste as part of the U.S. Department of

The Nuclear Power 2010 program is evaluating advanced light-water reactors for near-term deployment.

Safe, pelletized fuel is being researched as a potential fuel form for advanced nuclear power systems.

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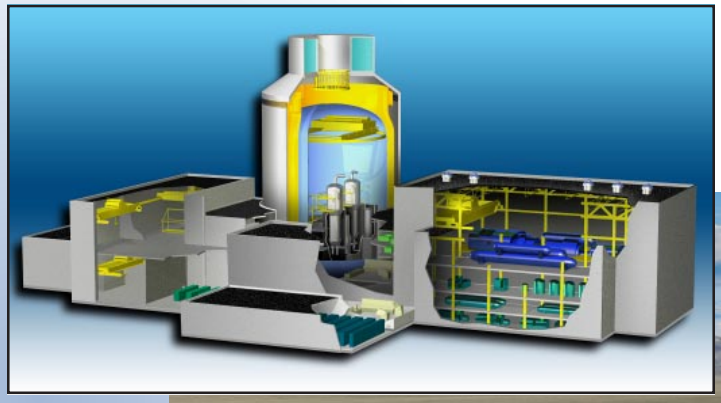
nation used to produce life-saving medical and industrial radioisotopes.

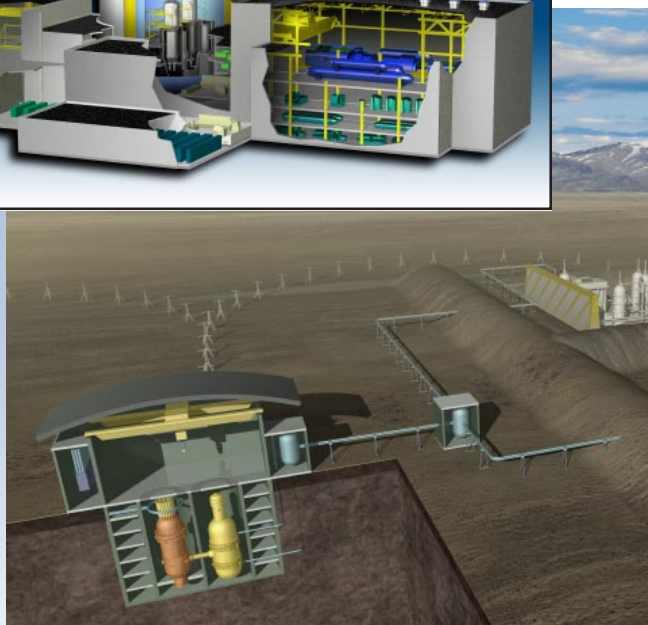
- The laboratory developed prototype nuclear propulsion plants for Navy submarines and aircraft carriers.

Over the years, INL's mission broadened into areas such as biotechnology, energy and materials research, and waste treatment and cleanup of Cold War-era sites. Today, INL is focused on meeting the nation's energy, nuclear technology, science, and national and homeland security needs.

Advanced Nuclear Energy Research

INL is designated as the nation's lead laboratory for nuclear energy research and development because of its unique history, infrastructure, expertise and partnerships. The work at INL has improved medical care, strengthened national and homeland security, and helped the United States develop safe, reliable and affordable nuclear power

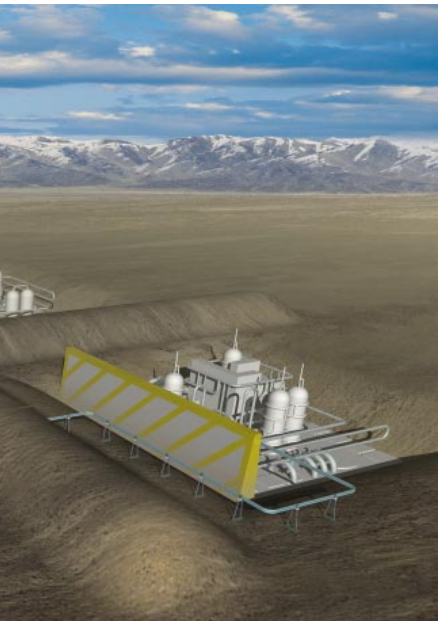




Energy's (DOE) Advanced Fuel Cycle initiative

- Supporting the Nuclear Power 2010 program, a government-industry partnership to evaluate and enable the deployment of new nuclear power plants in the United States by the close of the decade

Nuclear technology is being employed in a variety of national security and medical applications.



The Very-High Temperature Reactor, with its ability to efficiently produce hydrogen, is one of six promising Gen-IV technologies being researched.

Medical technologies

- Helping develop boron neutron capture therapy techniques to treat cancer and alleviate pain
- Producing isotopes to power highly specialized radiosurgery devices
- Calibrating important medical diagnostic equipment

Homeland security

- Developing technologies to scan shipping containers to detect smuggled nuclear materials
- Developing technologies to remotely detect explosives without putting people or bomb-sniffing dogs in harm's way
- Refining INL-developed technology to determine the amount and type of chemical agent in shells and other containers suspected of containing hazardous materials

Space technologies

- Developing nuclear-powered generators and heaters (a.k.a. "space batteries") for NASA's deep space missions

Infrastructure

INL's unique physical assets allow it to be an international leader in nuclear energy technology research and development. The laboratory has three major facility areas:

- Materials and Fuels Complex
- Reactor Technology Complex
- Science and Technology Campus

The **Materials and Fuels Complex** includes the Hot Fuel Examination, Fuel Conditioning, and Fuel Manufacturing facilities; the Zero-Power Physics Reactor; Fuel Assembly and Storage Building; and the new Space and Security Power Systems Facility.

The **Reactor Technology Complex** is anchored by the Advanced Test Reactor, the world's premier nuclear test reactor. The complex also features the Advanced Test Reactor-Critical Facility; Hot Cell Facility; Radiation Measurements Laboratory; Radiochemistry Laboratory; and the Safety and Tritium Applied Research Facility – a national fusion safety user facility.

The **Science and Technology Campus** is anchored by the INL Research Center, and includes High Temperature

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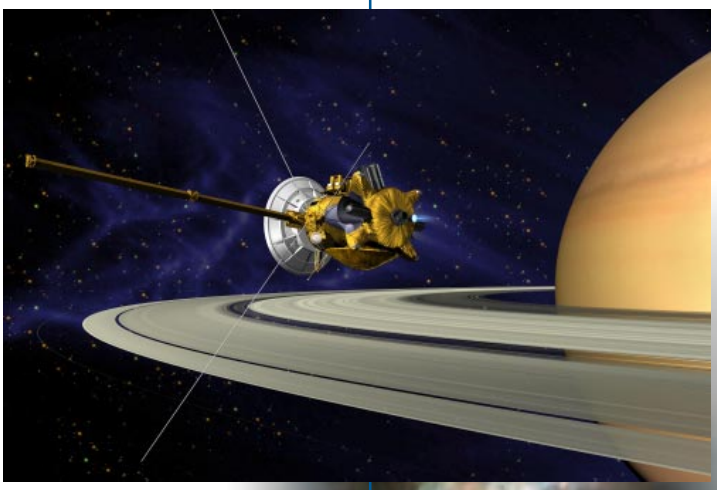

Nuclear-powered electrical generators and heaters have been developed for NASA to support key science missions, such as Cassini.

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Electrolysis and materials laboratories and the new Center for Advanced Energy Studies (CAES).

Meeting America's Energy Needs

The CAES, which opened its doors in June 2005, is designed to advance energy research, technology and engineering education, fostering innovations to meet the nation's energy needs. The CAES will focus on nuclear energy technology development, helping prepare the future researchers, designers, builders and operators of a revitalized nuclear power sector.

The CAES is a collaborative venture among DOE, the state of Idaho, the Idaho University Consortium, the National University Consortium, Battelle Energy Alliance, and INL. It will play a key role in U.S. and global energy research programs, structured around four main areas:

- Center for Nuclear Fuels and Materials Research
- Center for Space Nuclear Research
- Center for Nuclear Systems Design and Analysis
- Center for Advanced Modeling and Simulation

These comprehensive efforts, combined with INL's other research and development programs, are significantly advancing America's interests in energy, economic and national security.

The laboratory has three major facility areas: Materials and Fuels Complex (top), Reactor Technology Complex (middle), and Science and Technology Campus (bottom).

For more information:

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